

UTAH STATE IMPLEMENTATION PLAN

CONTROL MEASURES FOR AREA AND POINT SOURCES

SECTION IX PART G

FLUORIDE

IX.G.1 Designated Facilities: Chevron Chemical Company operates the only existing phosphate fertilizer plant in Utah. The fertilizer plant is located in a semi-arid, non-agricultural area near the junction of Utah State Highway 202 (Garfield Cut-Off Road) and Interstate 80. The plant began production in 1954 and has a production rate of about 65,000 TPY P_2O_5 .

The closest human habitations are in the town of Magna approximately four miles distant in a SSE direction with Kennecott Copper Corporation's 1500 acre tailings disposal area in between. There is pasture land in the vicinity of the junction of U.S. Highway Alt. 50 and Utah State Highway 111 near Magna, a distance of approximately four direct miles from the plant. From there, both southward and eastward are homes, pasture, and farm land.

The next closest human habitations are located in Tooele County in the general vicinity of the junction of Interstate 80 and Utah State Highway 36. They are few in number, and are about five miles distant from the plant. There are a few farms located a mile or so southward from there and east of Mills Junction.

IX.G.2 Justification for Emission Limitations

In cases of pollutants such as fluoride where the Administrator EPA has determined that a designated pollutant may cause or contribute to the endangerment of public welfare but where adverse effects on public health have not been demonstrated, the State may balance EPA guideline requirements against other factors of public concern in establishing emission standards. In establishing emission standards for the Chevron Chemical Company, phosphate fertilizer plant, the State has taken the following into consideration:

- a. The plant is located in an industrial area several miles from the nearest agricultural crops;
- b. The plant is small (less than 65,000 TPY P_2O_5) making treatment costs high on a per ton P_2O_5 basis; and
- c. The plant is remote from raw materials; and

- d. The plant is more than 20 years old.

IX.G.3. Emissions Inventory. The following baseline emissions inventory was established using stack tests for sources with stacks and reasonable estimates of non-stack emission sources.

	Projected	1981
	1983	
	<u>lb F/Day</u>	<u>lb F/Day</u>
Phosphoric Acid Plant (180 T/Day P ₂ O ₅ feed)		
Hemi Scrubber	115	19
Fishtail Fan	10	10
Bird Fan	18	18
Turbulaire Scrubber	6	6
Tank Farm	<u>24</u>	<u>24</u>
	Subtotal	173
	77	
<u>Super Phosphoric Acid Plant</u> (150 T/Day P ₂ O ₅ feed)		
Vacuum Exhaust	.2	.2
No. 1 Cooler	.2	.2
SGA Treatment scrubber	<u>1.0</u>	<u>1.0</u>
Subtotal	1.4	1.4
<u>Ammonium Phosphate Plant</u> (200 T/Day P ₂ O ₅ product)		
Dryer Venturi Scrubber	114	114
Airetron Scrubber	<u>446</u>	<u>89</u>
Subtotal	560	203
Grand total	734	281

IX.G.4 Emission Limitations/Control Strategy: The emission limitations are based on application of reasonably available control technology (RACT) to each process at the plant. Since there is no ambient standard for fluoride and the plant is located where expected impacts are small, the degree of control was determined by a technology based review. Due to the small size of the source and the relative insignificance of emissions, the RACT review was limited to a determination of where the greatest reductions in emissions could be achieved at the lowest cost to the company.

The review suggested that gases from the two largest facilities at the plant - The Hemi and Airetron Scrubbers - could receive additional control at a reasonable cost. The other facilities at the

plant would be significantly more expensive to treat due to low emission rates and/or high gas flow rates. The proposed control strategy will yield a 62% decrease in plant emissions with the addition of only two scrubbers. This represents a greater reduction in emissions at a lower cost to the company than the limitations contained in EPA guidance documents.

Phosphoric Acid Plant

a. Hemi Scrubber: Gas and vapor produced by acidulation of phosphate rock in a primary digester are withdrawn through an ejector scrubber (hemi) and discharged to the atmosphere. The Hemi scrubber is 80% efficient in fluoride removal, reducing the emission rate from 575 lbs/day to 115 lbs/day. To meet the proposed fluoride limitation, this source will be reduced to 19 lb/day total fluoride.

b. Fishtail Fan: Gypsum-phosphoric acid slurry is a source of fluoride emissions as it discharges onto pan filters from a fishtail spout. Total fluoride emissions from this source have been estimated via sampling to be 10 lbs/day. Capturing this low emission source would require the installation of extensive large diameter ductwork to route the emissions to a suitable scrubber. The high cost of additional treatment involved is not justified for this comparatively minor source of a welfare related pollutant.

c. Bird Fan: In 1979, emissions from this source were reduced from 30 lb/day total fluorides, as determined via emissions testing, to an estimated 18 lbs/day of total fluoride by replacement of the Bird centrifuge with a gravity settling system. No further reduction in emissions from this source is necessary to meet the proposed emission limitations.

d. Turbulaire Scrubber: The Turbulaire scrubber through which gas and vapor from the secondary digestors pass is 83% efficient in fluoride removal, leaving a residual of 6 lbs/day going to the atmosphere. The turbulaire is a high volume (20,000 SCFM) low emission source. To reduce emissions from this source a large scrubber of high horsepower would be necessary. Both the capital investment and the operating costs for such a scrubber would be high. The additional cost is not justified for a comparatively minor source of a welfare related pollutant.

e. Tank Farms: The phosphoric acid product is stored in large open tanks. Emissions from this source have been estimated to be less than 24 lbs/day total fluoride. No reduction in emissions from this source is required to meet the proposed fluoride limitations. Capturing emissions from this source would require the installation of roofs on fourteen storage tanks, eighteen feet in diameter, an extensive ductwork system, and a suitable scrubber. The necessary capital investment for such a collection/treatment system would be prohibitive.

Ammonium Phosphate Plant

a. Drier Venturi Scrubber: During production of ammonium phosphate, the gases from the

product dryer are drawn through a venturi scrubber which exhausts fluorides at the rate of 114 lbs/day. No reduction in emissions from this source is required to meet the proposed fluoride emission limitations. This source is very high volume (40,000 scfm) and would thus require a very large scrubber of high horsepower to reduce emissions. The cost-benefit ratio of such an expensive facility is not justified for removal of a welfare related pollutant in a somewhat remote area.

b. Airetron Scrubber: Large quantities of fluorides are emitted from the reactors and pugmill in this plant. Even after passing through an Airetron scrubber, fluorides are emitted from these sources at a rate of 446 lbs/day during ammonium phosphate production. This source accounts for approximately one third of the total fluoride emissions from the entire phosphate fertilizer facility. To meet the proposed fluoride emission limitation, this source would be reduced to 89 lbs/day total fluorides.

Superphosphoric Acid Plant

Phosphoric acid is concentrated to superphosphoric acid (66% P_2O_5 content or greater) by heat and vacuum evaporation of water. Emissions from this source are already being treated by a cross flow packed scrubber to give total emissions of less than 1.5 lbs/day total fluoride.